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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/502,468	07/22/2004	Michihiko Shouji	24530-004	4022

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Attention: PATENTS
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EXAMINER	
LAY, MICHELLE K	
ART UNIT	**PAPER NUMBER**
2672	

DATE MAILED: 12/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/502,468	SHOUJI, MICHIHIKO	
	Examiner	Art Unit	
	Michelle K. Lay	2672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 November 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 November 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

The amendment filed on 28 November 2005, has been entered and made of record. The replacement drawings filed 28 November 2005 has overcome the drawing objection made in the Non-Final office action filed 24 August 2005. Claims 1-28 are pending.

Response to Arguments

Applicant's arguments filed 28 November 2005 have been fully considered but they are not persuasive.

Applicant argues "Evaluation of Artificial Reality" publication does not disclose the claimed generated nimbus. Examiner respectfully disagrees. Applicant provided support in the specification of the generated nimbus however, Applicant failed to distinguish how the claims overcome the prior art.

Applicant argues "Evaluation of Artificial Reality" publication does not disclose lacking area for showing the observer a second actual object having a part which exists on the observer side than the actual object, and wherein said nimbus generating device also generates a nimbus image around a periphery of the lacking area. Examiner respectfully disagrees. Again, Applicant provided support in the specification of this lacking area however, Applicant failed to distinguish how the claims overcome the prior art.

Claim Objections

Claim 1 is objected to because of the following informalities: On line 9, "an display" should be changed to "a display". Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims **27** and **28** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Referring to claims **27** and **28**, measuring a velocity of the actual object is not supported by the specification. Even though paragraphs [0102-0104] mention speed of the humanoid robot, it is unclear from Applicant's disclosure how this velocity is measured.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 27 and 28 recites the limitation "measures a velocity" in line 2. It is unclear how this velocity is measured. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims **1-8**, **10-15**, **17-22**, and **24-26** rejected under 35 U.S.C. 103(a) as being unpatentable over "Evaluation of Artificial Reality: Chapter 1" (referred to EAR).

EAR teaches the limitations of claims **1-8**, **10-15**, **17-22**, and **24-26** with the exception of disclosing a nimbus (claims **1-4**, **11**, **12**, **18**, **19**, **25**) and a second object (claims **10**, **17**, **24**, **26**). However the system of EAR is used for superimposing an outer appearance formed by CG on an assistive robot where the size of the displayed CG is increased larger than the actual robot to prohibit the robot from being seen behind the superimposed outer appearance.

In regards to claims **1-4**, **11**, **12**, **18**, **19**, **25** –

The configuration of an augmented reality image display system is shown in Fig. 1.32. Based on the visual point position and attitude information obtained from a three-dimensional position sensor attached to the head, CG are generated by a computer

(claims **3**, **4**, **12**, **19**, **25**: ***an image generating device for generating computer graphics in a figure corresponding to a figure of an actual object and a positional relationship between an observer, who is viewing the actual object, and the actual object***) [pg. 10, lines 24-25; pg. 11, line 1]. Furthermore, the CG can be selected by taking the form of a character that the user likes, a deceased spouse, or the like (claims **1**, **2**, **11**, **18**: ***an image selecting device for selecting computer graphics in a figure of an actual object and a positional relationship between an observer, who is viewing the actual object, and the actual object***) [pg. 7, lines 1-3; Fig. 1.3]. Simultaneously, a real image of the background is obtained from a CCD camera, and using the luminance key synthesis of a video mixer (claims **1-4**, **11**, **12**, **18**, **19**: ***a combined image generating device for generating a combined image combining the graphics and the nimbus image***), each are synthesized and displayed on an HMD as augmented reality (claims **1-4**, **25**: ***an image display processing device for displaying the combined image on an display which is viewed by the observer so that the combined image is superimposed on the actual object***) [pg. 10, line 24 – pg. 11, line 4]. The video mixer also doubles as the combined image sending device as disclosed in claims **2** and **4**, where as shown in Fig. 1.32, the video mixer sends the combined image of the CG and real image obtained by the camera to the HMD (claims **2**, **4**: ***a combined image sending device for sending the combined image to the observer side***). Furthermore, in this system, an Isotrak2 (made by Polhemus) is used as the magnetic three-dimensional position sensor. The computer is a TD-30 (made by Intergraph; CPU: Pentium 133 MHzx2, with built-in Open GL graphics accelerator), and

an FS5 (made by Virtual Research Systems) is used as the HMD [pg. 11, lines 5-10]. These provide the means as disclosed in claims **18** and **19**.

EAR does not explicitly teach a nimbus image, however, the system proposed in EAR is for superimposing an outer appearance formed by CG on an assistive robot performing tasks indoor. The error of the CG display position is such that the size of the displayed CG is increased larger than the actual robot [pg. 18, lines 7-15]. It would have been obvious for the system of EAR to have a nimbus image i.e., the error of the CG display position, around the periphery of the computer graphics in order to prohibit the robot from being seen behind the superimposed CG (claims **1-4**, **11**, **12**, **18**, **19**, **25**: ***a nimbus generating device for generating a nimbus image around a periphery of the computer graphics***).

In regards to claims **5**, **13**, **20** –

The rationale of claims 1-4, 11, 12, 18 and 19 are incorporated herein. The system is for superimposing an outer appearance formed by CG on an assistive robot performing tasks indoor. Since the total width of the robot performing a carrying task or the like is about 500 mm, and moreover, the robot is used indoors, it is assumed that it operates nearly 2 m in front of the user. The error of the CG display position is such that the size of the displayed CG is increased larger than the actual robot by as much as this error [pg. 18, lines 7 – 15]. This increased size of the display CG corresponds to the nimbus as disclosed. The maximum position error corresponds to the positional error when the robot is some distance away. The CG can be increased to

counterbalance this error (claims **5**, **13**, **20**: ***wherein said nimbus generating device estimates an error in measurement of a distance between the observer and the actual object, and generates based on the error the nimbus image having an adequate thickness for preventing the actual object from being seen protruding from a periphery of the computer graphics***) [pg. 18, lines 19 – 22].

In regards to claims **6**, **14**, **21** –

The rationale of claims 1-4, 11, 12, 18 and 19 are incorporated herein. From the example cited in claim rejections 5/1, 5/3, the maximum error (22 mm) corresponds to the positional error (44 mm) when the robot is 2 m away from the user. The resulting error is about one-tenth the size of the robot, and the CG can be increased to counterbalance this error. By correcting the three-dimensional position sensor, it is thought that the error can be controlled within a substantially permissible range (claims **6**, **14**, **21**: ***wherein said nimbus generating device generates the nimbus image having an adequate thickness for not showing the observer a displacement which occurs between the actual and the computer graphics when the actual object or the observer moves***) [pg. 18, lines 16 – 20; pg. 19, line 1].

In regards to claims **7**, **15**, **22** –

The rationale of claims 1-4, 11, 12, 18 and 19 are incorporated herein. In order to superimpose the CG on the robot and synthesize an image without a feeling of incompatibility, accuracy was required of the three-dimensional position sensor [pg. 12,

lines 1 – 3]. As seen in Fig. 1.34, the rotation of the head to the right and left is measure by the sensor as a change in angle of direction, the tilting back and forth is measured as a change in the angle or elevation, and the tilting to right and left is measured as a change in the angle of torsion (claims **7**, **15**, **22**: ***a detecting device for detecting at least one of distance and an angle between a display with is viewed by the observer and the actual object and a direction of the actual object seen from the observer***) [pg. 13, lines 4 – 8].

In regards to claim **8** –

The rationales of claims 1-4 are incorporated herein. The CG of a human shape on an arm-type care-giving robot used for a carrying task actually located at a position 2m away from the user [pg. 20, lines 7 – 9]. Furthermore, although a CG was superimposed on a target robot standing still, the robot actually changes position and attitude over time (claim **8**: ***wherein the actual object is a humanoid robot or an animal-type robot other than a human, which can move freely***) [pg. 22, lines 7- 9].

In regards to claims **10**, **17**, **24**, **26** –

The rationale of claims 1-4, 11, 12, 18, 19 and 25 are incorporated herein. "Evaluation of Artificial Reality: Chapter 1" teaches the limitations of claims **10**, **17**, **24**, **26** except disclosing a second actual object. However, EAR teaches the CG of a human shape is superimposed on an arm-type care-giving robot used for a carrying task [pg. 20, lines 7 – 9]. The camera as shown in Fig. 1.32 will record the robot

carrying the item related to the carrying task and the video mixer superimposes the CG of a human shape on top of the robot. Since the CG is only of the human shape and does not contain a CG of the item related to the carrying task, it would have been obvious to one of ordinary skill in the art that the work station shown in Fig. 1.32 provides a mask to reveal the item related to the carrying task so that the super-imposed image sent to the HMD via the video mixer displays the item to the user so the robot looks like a character the user finds comforting performing the task (claims **10**, **17**, **24**, **26**: ***wherein the computer graphics have a lacking area for showing the observer a second actual object having a part which exists on the observer side than the actual object***). Although a CG was superimposed on a target robot standing still, the robot actually changes position and attitude over time [pg. 22, lines 7- 9]. The error of the CG display position is such that the size of the displayed CG is increased larger than the actual robot [pg. 18, lines 7 – 15]. This error, i.e. nimbus, compensates for the possible movement of the robot so when the robot moves, so that there is no chance that the actual robot will be seen apart from the CG superimposed. Thus, if the robot were carrying an item, it would have been obvious to include a nimbus around the item for the same reason (claims **10**, **17**, **24**, **26**: ***wherein said nimbus generating device also generates a nimbus image around a periphery of the lacking area***).

2. Claims **9**, **16**, **23** are rejected under 35 U.S.C. 103(a) as being unpatentable over "Evaluation of Artificial Reality: Chapter 1" in view of Yuasa et al. (US Patent No. 6,184,888 B1).

"Evaluation of Artificial Reality: Chapter 1" (referred to as EAR) teaches the limitations of claims **9**, **16**, and **23** with the exception of disclosing receiving the computer graphics from outside via a network. However, Yuasa et al. teaches an image rendering apparatus and method intended for use in an environment in which the data transfer rate is limited, as in a network such as the Internet.

EAR discloses a system for superimposing an outer appearance formed by CG on an assistive robot performing tasks indoor. The error of the CG display position is such that the size of the displayed CG is increased larger than the actual robot [pg. 18, lines 7-15]. This increased size of the display CG corresponds to the nimbus as disclosed. The configuration of an augmented reality image display system is shown in Fig. 1.32. Based on the visual point position and attitude information obtained from a three-dimensional position sensor attached to the head, CG is generated by a computer [pg. 10, line 24 – pg. 11, line 1]. Furthermore, the CG can be selected by taking the form of a character that the user likes, a deceased spouse, or the like [pg. 7, lines 1-3; Fig. 1.3]. Simultaneously, a real image of the background is obtained from a CCD camera, and using the luminance key synthesis of a video mixer, each are synthesized and displayed on an HMD as augmented reality [pg. 10, line 24 –pg. 11, line 4]. The video mixer also doubles as the combined image sending device, where as shown in Fig. 1.32, the video mixer sends the combined image of the CG and real image obtained by the camera to the HMD. Furthermore, in this system, an Isotrak2 (made by Polhemus) is used as the magnetic three-dimensional position sensor. The computer is a TD-30 (made by

Intergraph; CPU: Pentium 133 MHzx2, with built-in Open GL graphics accelerator), and an FS5 (made by Virtual Research Systems) is used as the HMD [pg. 11, lines 5-10].

Yuasa et al. teaches an image rendering apparatus and method intended for use in an environment in which the data transfer rate is limited, as in a network such as the Internet. As shown in Fig. 1, the rendering apparatus (100) resides in the computer (102). The rendering apparatus may form part of a graphics card located in the computer or may be a hardware accessory that plugs into or is otherwise connected to the graphics card of the computer [col. 6, lines 28-48]. The computer is shown connected via the I/O port (104) as a client of the network (106). The I/O port is connected directly or indirectly to the bus (108) to which other elements of the rendering apparatus and the computer are connected. The network, I/O port and bus constitute a path through which the rendering apparatus receives three-dimensional graphics data including texture data defining one or more textures (claims **9**, **16**, **23**: ***comprising a communication device for receiving the computer graphics from outside via a network***) [col. 6, lines 39-46].

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the rendering apparatus of Yuasa et al. as a part of the Open GL graphics accelerator built-in the computer disclosed in "Evaluation of Artificial Reality: Chapter 1", as well as incorporate the I/O port of Yuasa et al. to connect the computer disclosed in "Evaluation of Artificial Reality: Chapter 1" to a network because this would allow the user to import images from other sources, such as the internet, when the user is opting to select the CG by taking the form of a

character that the user likes, a deceased spouse, or the like ["Evaluation of Artificial Reality: Chapter 1": pg. 7, lines 1-3; Fig. 1.3]. Furthermore, importing the images from another source provides a larger range of characters the user may choose from as well as saving memory space on the computer by not having to generate and save multitudes of characters.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle K. Lay whose telephone number is (571) 272-7661. The examiner can normally be reached on Monday - Friday, 7:00am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi can be reached on (571) 272-7664. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Michelle K. Lay
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12.07.2005 mkl

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